Serial No.: 09/186, 247

REMARKS

These remarks follow the order of the paragraphs of the office action. Relevant portions of the office action are shown indented and italicized

Claim Rejections -35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
A person shall be entitled to a patent unless -
(e) the invention was described in (1) an application for patent, published under Section 122(t)), by another filed in the United States before the invention by tile applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application tiled under the treaty defined in section 351(a) shall have the effects far purposes of his subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (US 6, 256, 349).

Regarding claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90, rejection is maintained provided in the previous office action (paper dated 6/30/2005).

In response, applicants respectfully state that indeed the remarks in the paper dated 5/09/2005 clearly show that the invention as in Claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90, is novel and not anticipated by Suzuki. Applicants fail to understand the continued rejection under paragraphs of 35 U.S.C. 102.

The cited art to Suzuki, US Patent 6, 256, 349, was filed: December 24, 1996, and is entitled, "Picture signal encoding method and apparatus, picture signal transmitting method, picture signal decoding method and apparatus and recording medium." The Suzuki abstract reads, "[T]here is provided a picture signal encoding method in which a signal obtained on processing picture signals with encoding accompanying real-number calculations and the resulting quantized signal is outputted, locally decoded data of the encoded data and data prevailing prior to execution of the real-number calculations are compared to each other to find a difference signal. This

difference signal is added to decoded data for signal correction for realizing reversible encoding and the encoding/decoding of high-precision picture signals. Also provided are a corresponding signal encoding apparatus, a picture signal transmitting method, a picture signal decoding method and apparatus and a recording medium having thereon recorded signal decodable by the picture decoding apparatus." This does not anticipate the invention in claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90.

Standard data compression processes (i.e. JPEG and MPEG) define that the output of the IDCTs (e.g. Suzuki S2, Column 5, line 7) shall be rounded to integers of the same precision as the original data (e.g. Suzuki S1 , Column 5, line 4). The present invention violates the standard to achieve particular advantages described in the specification. To achieve the invention in claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90, one must use FDCTs for transforming S2 that accept more precision at the original S1.

In contrast to the present invention, Suzuki has two bit streams. For example, in Figure 1 the transmission buffer 59 outputs a bit stream that is a traditional MPEG process. The signal S1, prediction (skipped for I-frames), FDCT, quantization to get quantized coefficients before VLC. The encoder does the dequantization and IDCT 61 creating signal S2. A separate signal S3=S2-S1 is sent as a difference bitstream via transmission buffer 73 to capture missing data lost in the DCT processing. There is NO extra precision in signal S2. In the decoder Figure 2 the two bitstreams are decoded and the signals summed to create S1'. Column 15 lines 10-11 claim that "Thus for reversible encoding, the information lost by DCT processing needs to transmitted separately." The only FDCT takes in precision S1. Column 21 lines 5- column 27 line 19 makes it clear in other embodiments that the S1 data must be converted to 8-bit picture data before processing through the FDCT and after the IDCT.

The present invention in claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90 is not attempting to achieve irreversible coding of the original signal S1. The presently claimed invention creates extra precision after the IDCT (e.g. in S2). Then without any extra bitstream, the present invention can go into another FDCT (not present in Suzuki) and match the quantized

coefficients after the FDCT if the data was not changed. The present invention accepts the original loss. It is in future iterations that the process of the present invention is lossless for unchanged data.

However in order to advance the prosecution to allowance independent claims 1, 46, 48, 59, 65, 85, 88-90, are further amended. Each more specifically shows that the high precision numbers are formed directly employing only the transform data having a precision greater than a precision of the original numbers, and the greater precision is maintained while manipulating. Applicants opine that 'directly ' and 'only' are inferred without specific declaration. The cited art although employing high precision numbers, does not form them directly from only the transform data, and does not maintain the greater precision in manipulating an effect. Thus independent claims 1, 46, 48, 59, 65, 85, 88-90, and all claims that depend upon these are allowable over the cited art. This includes claims 1, 3, 9, 15, 18-19, 21-22 46-49, 59-61, 65-66 and 85-90 which are novel and allowable.

Claim Rejections -35 USC § 103

4 The following is a quotation of 35 U.S.C. I 03(a) which forms the basis for all obviousness rejections set forth in this Office action:
(a) A patent may not be obtained though the Invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 4-8, 10-11, 16-17, 20, 23-25 55-58 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (US 6.256349) in view of Cheung et al. (US 6, 178, 205).
Regarding claims 2, 4-8. 10-11, 1 6-17, 20, 23-25 55-58 and 84, rejection is maintained provided in the previous office action (paper dated 6/30/2005).

In response, applicants respectfully state that claims 2, 4-8, 10-11, 16-17. 20, 23-25 55-58 and 84 are not made obvious by Suzuki with or without Cheung and continue to maintain the validity of the remarks made in the previous response. The remarks above further clarifies the differences between the present invention and Suzuki. The other cited reference to Cheong, US Patent 6,

178, 205, was filed: December 12, 1997, and is entitled, "Video postfiltering with motion-compensated temporal filtering and/or spatial-adaptive filtering." The abstract reads, "[A] postfiltering process for improving the appearance of a video image includes motion compensated temporal filtering and spatial adaptive filtering. For each target pixel being filtered, the temporal filtering uses multiple motion vectors and one or more pixel values for a prior frame to determine one of more reference values for the target filter. In one embodiment, a weighted average of multiple motion vectors for blocks near or containing the target pixel value provides a filter vector that points to a pixel value in the prior frame. This pixel value is a reference value for the target pixel value and is combined with the target pixel value in a filter operation. Alternatively, multiple motion vectors for blocks near or containing the target pixel value point to pixel values in the prior frame that are averaged to determine a reference value for the target pixel value. In each alternative, the weighting for the average is selected according to the position of the target pixel value. The spatial filtering determines a dynamic range of pixel values in a smaller block containing the target pixel value and a dynamic range of pixel values in a larger block containing the target pixel value. The two dynamic ranges suggest the image context of the target pixel, and an appropriate spatial filter for the target pixel is selected according to the suggested context." This is not and does not relevant to an does not make obvious the invention claimed in claims 2, 4-8, 10-11, 16-17. 20, 23-25 55-58 and 84.

Cheung (US Patent 6,178,205 B1) is apparently improving the appearance of video images by motion-compensated temporal filtering and spatial adaptive filtering. The "errors" referred to in this patent are from the original quantization. They are trying not to introduce "further degradation" (col 2 line 20) while removing artifacts and noise. It is not dealing with the errors introduced during the decoding process by rounding in the pixel domain. Thus neither Suzuki nor Cheung teach transforms that accept higher precision data. Nor do they separately or together iterate and achieve the original compressed data . Thus Claims 2, 4-8, 10-11, 16-17,20,23-25,55-58 and 84, as written and/or amended, are novel over the cited art, and are allowable.

It must be noted that, both Suzuki and Cheung round and clip at the output of the Inverse DCT and do not maintain any high precision higher than the precision of the precision of real domain data input into the forward transform as required by the JPEG and MPEG standard. The present invention **violates that requirement in both the MPEG and JPEG standards, and maintains extra precision** (more than the original precision of the real data input for the forward transform) to use for further manipulation. The present invention does not get the extra precision from a bit stream sent separately (see Suzuki). After the inverse transform both Suzuki and Cheung follow the instructions in the MPEG and JPEG standards which require that the output of the inverse transform be rounded to the original precision of input image data for the forward transform, which determine the allowed range of output values from the inverse transform.

Cheung is working with higher precision numbers during filtering. Cheung, Col 9 lines 30-34, states, "[A]fter filtering every pixel in the current array, temporal filter 130 rounds the filtered current array to normal pixel precision (e.g. 8-bits) and provides the rounded array to spatial adaptive filter 140." Cheung continues the processing (data manipulation) on the rounded values. The invention claimed in claims 2, 4-8, 10-11, 16-17. 20, 23-25 55-58 and 84 doesn't use rounded values. The present invention maintains the higher precision.

Cheung states in col 10 lines 39-42: "round_and_clip is a function that rounds its argument to the nearest integer and clips that result according to the range of allowed pixel value." Again Cheung takes his higher precision numbers to the integer values before and between his processing step. The 35 U.S.C. I 03(a) rejection is traversed. Thus the invention claimed in claims 2, 4-8, 10-11, 16-17. 20, 23-25 55-58 and 84 is allowable in itself, and also because each of these claims ultimately depends on an allowable claim.

Remarks

6. In the applicant's amendment/argument filed on O9/30/2005, applicant argued the following: The high precision numbers referred to in Suzuki are original input as integers with greater than 8 bits of precision (col. 16, lines 15-21). The high precision numbers in our invention and claims 1, 3, 9, 15. 18-19, 21-22.46-49, 59-61, 65-66 and 84-90, means greater than original input precision fed to the forward transform on second iteration.

Claims language recite performing inverse transform data to the real domain forming high precision number. In Figure 2 element 84, col. 3 line 1 thru col. 4 line 14 Suzuki

shows performing inverse transform data to the real domain forming high precision number. Claims language do not recite "the high precision numbers in our invention means greater than original input precision fed to the forward transform on second iteration". Therefore claim language does support the arguments.

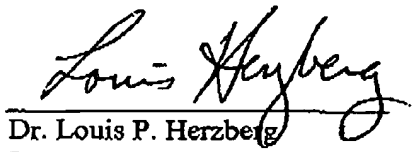
In claims 1, 3, 9, 15, 18-19, 21-22, 46-49, 59-61, 65-66 and 84-90, applicants are manipulating and re forward transforming data of greater precision.

Claims language do not recite manipulating and re forward transforming data of greater precision. Unfortunately claims are void of such limitation to support the Applicant' argument. Our decoder uses an encoder that accept higher precision data and gets exactly the same compressed data. Claims language do not recite decoder uses an encoder that accept higher precision data and gets exactly the same compressed data. Furthermore Suzuki also uses an encoder that accept higher precision data and gets exactly the same compressed data as shown in Figure 2 element 84, col. 3 line 1 thru col. 4 line 14.

In response, applicants respectfully state that the claims are amended to more clearly indicate that the high precision numbers in our invention means greater than original input precision and more clearly show that each uses an encoder that accepts higher precision data.

It is anticipated that this amendment brings the application to allowance of all claims except as withdrawn. Favorable action is respectfully solicited. If any rejections or objections remain, please call the undersigned. Please charge any fee necessary to enter this paper to deposit account 50-0510.

Respectfully submitted,

By: 

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